| *Office Action Summary* | Application No. 17/468,509 | Applicant(s) Manapragada, Sai C. | |
|---|---|---|---|
| | Examiner SAAD KHAWAR | Art Unit 2412 | AIA (FITF) Status Yes |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☑ Responsive to communication(s) filed on 2/3/22.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims***

5) ☑ Claim(s) 2-21 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 2-21 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

**Application Papers**

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 9/7/21 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.



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## DETAILED ACTION

### *Notice of Pre-AIA or AIA Status*

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

### *Priority*

3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, 365(c), or 386(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of 35 U.S.C. 112(a) or the first paragraph of pre-AIA 35 U.S.C. 112, except for the best mode requirement. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994)

The disclosure of the prior-filed application, Application No. 61897216, 61897219, 14526799, and 16039660 fail to provide adequate support or enablement in the manner provided by 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph for one or more claims of this application. The features of claims 6, 8, 13, 15, 19, and 21 are not supported by any of the previously filed specifications and are thus not entitled to the benefit of the prior applications. If applicant disagrees, applicant should point out what portions of the specification supports these claims from the earliest prior application in order to receive the benefit of the earliest possible filing date.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claim 2** is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

6. Claim 2 recites the limitation "the first processing logic". There is insufficient antecedent basis for this limitation in the claim.

***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research

agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

8. **Claims 2-5, 7, 9-12, 14, 16-18, and 20** are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 10, and 15 of U.S. Patent No. **US11115834B2**.

9. Regarding claim 2, the claims of **US11115834B2** disclose:

"A WiFi wireless access point, comprising: wireless transceiver circuitry, configured to (1) establish a WiFi wireless link to a wireless local area network, (2) provide wireless access to the WiFi wireless link within a first coverage area, and (3) establish a second wireless link to a second WiFi wireless access point;" **([claim 15]: "A WiFi wireless access point, comprising: wireless transceiver circuitry, configured to (1) establish a WiFi wireless link to a wireless local area network, (2) provide wireless access to the wireless link within a first coverage area, and (3) establish a wireless link to a second WiFi wireless access point;")**

"processing logic that cooperates with second processing logic of the second WiFi wireless access point to define distributed processing logic, the distributed processing logic configured to control the wireless transceiver circuitry;" **([claim 15]: "processing logic that cooperates with second processing logic of the second WiFi wireless access point to define distributed processing logic, the distributed processing logic configured to control the wireless transceiver circuitry;")**

"wherein the first processing logic is configured to grant a user access to the wireless local area network via a virtual link based on network resource availability; and" **([claim 15]: "wherein the**

**distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

"wherein the wireless transceiver circuitry includes multiple access transceivers that each provide a given bandwidth and that are aggregated to define the virtual link with an available bandwidth greater than the given bandwidth." **([claim 15]: "wherein the wireless transceiver circuitry includes multiple access transceivers that each provide a given bandwidth and that are aggregated to define a single virtual link with an available bandwidth greater than the given bandwidth;")**

Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 2 of the instant application merely broaden the scope of claim 15 of **US11115834B2** by omitting limitations, such as that the network availability is based on an indicator that is fed back from the wireless transceiver circuitry to the distributed processing logic. It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re Karlson, 136 USPQ 184 (CCPA), also note Exparte Rainu, 168 USPQ 375 (Bd. App. 1969); the omission of a reference element whose function is not needed would be obvious to one skilled in the art. This reasoning also applies for all dependent claims.

10. Regarding claim 3, the claims of **US11115834B2** disclose all the features of the parent claim.

**US11115834B2** further discloses "wherein the network resource availability comprises: an indicator of wireless transceiver availability." **([claim 15]: "wherein the distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

11. Regarding claim 4, the claims of **US11115834B2** disclose all the features of the parent claim.

**US11115834B2** further discloses "wherein the indicator of wireless transceiver availability comprises: an indicator of wireless transceiver availability among the multiple access transceivers of the WiFi wireless access point." **([claim 15]: "wherein the distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver**

**availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

12. Regarding claim 5, the claims of **US11115834B2** disclose all the features of the parent claim.

**US11115834B2** further discloses "wherein: the indicator of wireless transceiver availability is fed back from the wireless transceiver circuitry to the distributed processing logic." **([claim 15]: "wherein the distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

13. Regarding claim 7, the claims of **US11115834B2** disclose all the features of the parent claim.

**US11115834B2** further discloses "wherein the network resource availability comprises: an indicator of bandwidth availability." **([claim 15]: "wherein the distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

14. Regarding claim 9, the claims of **US11115834B2** disclose:

"A WiFi wireless local area networking system, comprising: a first WiFi wireless access point having first processing logic, the first WiFi wireless access point including first wireless transceiver circuitry, to (1) establish a WiFi wireless link to a wireless local area network, and (2) provide wireless access to the wireless link within a first coverage area;" **([claim 1]: "A WiFi wireless local area networking system comprising: a first WiFi wireless access point having a first coverage area, the first WiFi wireless access point including first wireless transceiver circuitry, to (1) establish a WiFi wireless link to a wireless local area network, and (2) provide wireless access to the wireless link within a first coverage area, and first processing logic;"**

"a second WiFi wireless access point having second processing logic that cooperates with the first processing logic to define distributed processing logic," **([claim 1]: "wherein the first and second processing logic cooperate to define distributed logic.")**

"the second WiFi wireless access point including second wireless transceiver circuitry to establish a second wireless link with the first wireless transceiver circuitry, the second wireless transceiver circuitry

including multiple access transceivers to provide a first user access to the WiFi wireless link to the wireless local area network via the second wireless link, wherein the multiple access transceivers each provide a given bandwidth and are aggregated by the second processing logic to define a single virtual link with an available bandwidth greater than the given bandwidth; and" **([claim 1]: "the second WiFi wireless access point including second wireless transceiver circuitry to establish a second wireless link with the first wireless transceiver circuitry, the second wireless transceiver circuitry including multiple access transceivers to provide a first user access to the WiFi wireless link to the wireless local area network via the second wireless link, the second WiFi wireless access point including second processing logic to control the second wireless transceiver circuitry and the multiple access transceivers, wherein a first sub-group of the multiple access transceivers are aggregated by the second processing logic to define a first virtual link, and a second sub-group of the multiple access transceivers are aggregated by the second processing logic to define a second virtual link")**

"wherein the second processing logic is configured to grant the user access to the wireless local area network via the virtual link based on network resource availability." **([claim 15]: "wherein the distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 2 of the instant application merely broaden the scope of claim 15 of **US11115834B2** by omitting limitations, such as that "wherein at least one of the multiple access transceivers is configured in a randomly on-demand manner to have a first portion of its bandwidth allocated to the first virtual link, and a second portion of its bandwidth allocated to the second virtual link". It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re Karlson, 136 USPQ 184 (CCPA), also note Exparte Rainu, 168 USPQ 375 (Bd. App. 1969); the omission of a reference element whose function is not needed would be obvious to one skilled in the art. This reasoning also applies for all dependent claims.

15. Claims 10-12 and 14 are similar to claims 3-5 and 7 and are thus rejected for similar reasons.

16. Regarding claim 16, the claims of **US11115834B2** disclose:

"A method of providing WiFi wireless local area network access to a user, the method comprising: communicating with a wireless local area network using first wireless transceiver circuitry associated with a first WiFi wireless access point, the first WiFi wireless access point having a first coverage area;" **([claim 10]: "A method of providing WiFi wireless local area network access to a user, the method comprising: accessing a wireless network with first wireless transceiver circuitry associated with a first WiFi wireless access point, the first WiFi wireless access point having a first coverage area;")**

"establishing a wireless link between the first WiFi wireless access point and second wireless transceiver circuitry associated with a second WiFi wireless access point, the second WiFi wireless access point having a second coverage area;" **([claim 10]: "establishing a wireless link between the first WiFi wireless access point and second wireless transceiver circuitry associated with a second WiFi wireless access point, the second WiFi wireless access point having a second coverage area;")**

"granting a user access to the wireless local area network via a virtual link based on network resource availability; and" **([claim 15]: "wherein the distributed processing logic defines the single virtual link with an available bandwidth that is based on an indicator of wireless transceiver availability that is fed back from the wireless transceiver circuitry to the distributed processing logic.")**

"configuring the first wireless transceiver circuitry and the second wireless transceiver circuitry with distributed logic associated with the first WiFi wireless access point and the second WiFi wireless access point, wherein the configuring includes, for each WiFi wireless access point, aggregating at least two access transceivers to define the virtual link with an available bandwidth greater than a given bandwidth associated with each access transceiver." **([claim 10]: "configuring the first wireless transceiver circuitry and the second wireless transceiver circuitry with distributed logic associated with the first WiFi wireless access point and the second WiFi wireless access point, wherein the configuring includes, for each WiFi wireless access point, aggregating a first sub-**

**group of multiple access transceivers to define a first virtual link, and a second sub-group of the multiple access transceivers to define a second virtual link")**

Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 2 of the instant application merely broaden the scope of claim 15 of **US11115834B2** by omitting limitations, such as that "wherein at least one of the multiple access transceivers is configured in a randomly on-demand manner to have a first portion of its bandwidth allocated to the first virtual link, and a second portion of its bandwidth allocated to the second virtual link". It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re Karlson, 136 USPQ 184 (CCPA), also note Exparte Rainu, 168 USPQ 375 (Bd. App. 1969); the omission of a reference element whose function is not needed would be obvious to one skilled in the art. This reasoning also applies for all dependent claims.

17. Claims 17-18 and 20 are similar to claims 3-5 and 7 and are thus rejected for similar reasons.

***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

19. The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. **Claim(s) 2-4, 6-11, and 13-21** is/are rejected under 35 U.S.C. 103 as being unpatentable over **Rahman** (US 20080084855 A1) in view of **Kim** (US 20110128919 A1) and further in view of **Conner** (US 20060140123 A1).

21. Regarding claim 2, **Rahman** discloses:

"A WiFi wireless access point, comprising: wireless transceiver circuitry, configured to (1) establish a WiFi wireless link to a wireless local area network, (2) provide wireless access to the WiFi wireless link within a first coverage area, and (3) establish a second wireless link to a second WiFi wireless access point;" **([para 0026]: "Thus, shown in the example mesh network 100 is a root AP 101 with a direct backhaul link to mesh AP 103 and to mesh AP 105. The mesh AP 105 has a direct backhaul link to a mesh point 107 that acts as a relay, to a mesh AP 109. The relay mesh point 107 has a direct backhaul link to mesh AP 111, and, as described above, can be considered mesh AP 107. Each mesh AP has a backhaul radio interface and an access radio interface, and can form an infrastructure wireless network via its access radio interface. FIG. 1 shows mesh AP 111 with its infrastructure wireless network 117, including a client station 113 and a client station 115.")**

"processing logic that cooperates with second processing logic of the second WiFi wireless access point to define distributed processing logic, the distributed processing logic configured to control the wireless transceiver circuitry…" **([para 0032]: "FIG. 2 shows an example mesh AP, say mesh AP 111 that includes a backhaul radio interface 201, an access radio interface 203, and an AP control processor 205 to which the backhaul and access radio interfaces are coupled." ; [para 0103]: "The processing system further may be a distributed processing system with processors coupled by a network.")**

**Rahman** does not explicitly disclose "wherein the first processing logic is configured to grant a user access to the wireless local area network via a virtual link based on network resource availability; " nor "wherein the wireless transceiver circuitry includes multiple access transceivers that each provide a given bandwidth and that are aggregated to define the virtual link with an available bandwidth greater than the given bandwidth."

However, **Kim** discloses the missing feature "wherein the wireless transceiver circuitry includes multiple access transceivers that each provide a given bandwidth and that are aggregated to define the

virtual link with an available bandwidth greater than the given bandwidth." **([para 0056]: "For example, if the UE 505 is using a first transceiver having a maximum bandwidth of 20 MHz at a frequency band, and the UE 505 can aggregate carriers of up to 40 MHz at the frequency band, the N/W 510 commands the UE 505 to use a second transceiver that can support the frequency band that has a wider bandwidth than that of the first transceiver." ; [para 0058]: "The UE 505 switches on a transceiver indicated in the message and then aggregates carriers by the newly added transceiver in step 545… In that case, the control message would contain information regarding the frequency bands of the different carriers to be aggregated, center frequency information and bandwidth information as well as identifiers regarding transceivers to be mapped to the different carriers.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** with the link aggregation disclosed by **Kim**. The motivation is to allow for greater bandwidth as compared to only using a single transceiver, thereby enhancing service quality.

**Rahman** in view of **Kim** do not explicitly disclose "wherein the first processing logic is configured to grant a user access to the wireless local area network via a virtual link based on network resource availability".

However, **Conner** discloses the missing feature "wherein the first processing logic is configured to grant a user access to the wireless local area network via a virtual link based on network resource availability" **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

22. Regarding claim 3, **Rahman** in view of **Kim** and **Conner** discloses all the features of the parent claim.

**Rahman** in view of **Kim** do not explicitly disclose "wherein the network resource availability comprises: an indicator of wireless transceiver availability.".

However, **Conner** discloses the missing feature "wherein the network resource availability comprises: an indicator of wireless transceiver availability." **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

23. Regarding claim 4, **Rahman** in view of **Kim** and **Conner** discloses all the features of the parent claim.

**Rahman** does not explicitly disclose "wherein the indicator of wireless transceiver availability comprises: an indicator of wireless transceiver availability among the multiple access transceivers of the WiFi wireless access point.".

However, **Kim** discloses the missing feature "among the multiple access transceivers of the WiFi wireless access point." **([para 0056]: "For example, if the UE 505 is using a first transceiver having a maximum bandwidth of 20 MHz at a frequency band, and the UE 505 can aggregate carriers of up to 40 MHz at the frequency band, the N/W 510 commands the UE 505 to use a second transceiver that can support the frequency band that has a wider bandwidth than that of the first transceiver." ; [para 0058]: "The UE 505 switches on a transceiver indicated in the message and then aggregates carriers by the newly added transceiver in step 545… In that case, the control message would contain information regarding the frequency bands of the different carriers to be aggregated, center frequency information and bandwidth information as well as identifiers regarding transceivers to be mapped to the different carriers.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** with the link aggregation disclosed by **Kim**. The motivation is to allow for greater bandwidth as compared to only using a single transceiver, thereby enhancing service quality.

**Rahman** in view of **Kim** do not explicitly disclose "wherein the indicator of wireless transceiver availability comprises: an indicator of wireless transceiver availability".

However, **Conner** discloses the missing feature "wherein the indicator of wireless transceiver availability comprises: an indicator of wireless transceiver availability" **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

24. Regarding claim 6, **Rahman** in view of **Kim** and **Conner** discloses all the features of the parent claim.

**Rahman** in view of **Kim** do not explicitly disclose "wherein the network resource availability comprises: an indicator of internet connectivity availability".

However, **Conner** discloses the missing feature "wherein the network resource availability comprises: an indicator of internet connectivity availability." **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

25. Regarding claim 7, **Rahman** in view of **Kim** and **Conner** discloses all the features of the parent claim.

**Rahman** in view of **Kim** do not explicitly disclose "wherein the network resource availability comprises: an indicator of bandwidth availability".

However, **Conner** discloses the missing feature "wherein the network resource availability comprises: an indicator of bandwidth availability." **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

26. Regarding claim 8, **Rahman** in view of **Kim** and **Conner** discloses all the features of the parent claim.

**Rahman** in view of **Kim** do not explicitly disclose "the distributed processing logic is further configured to grant a user access to the wireless local area network based on prior access decisions.".

However, **Conner** discloses the missing feature "the distributed processing logic is further configured to grant a user access to the wireless local area network based on prior access decisions." **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102**

**may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

27. Regarding claim 9, the claims of **Rahman** discloses:

"A WiFi wireless local area networking system, comprising: a first WiFi wireless access point having first processing logic, the first WiFi wireless access point including first wireless transceiver circuitry, to (1) establish a WiFi wireless link to a wireless local area network, and (2) provide wireless access to the wireless link within a first coverage area;" **([para 0026]: "Thus, shown in the example mesh network 100 is a root AP 101 with a direct backhaul link to mesh AP 103 and to mesh AP 105. The mesh AP 105 has a direct backhaul link to a mesh point 107 that acts as a relay, to a mesh AP 109. The relay mesh point 107 has a direct backhaul link to mesh AP 111, and, as described above, can be considered mesh AP 107. Each mesh AP has a backhaul radio interface and an access radio interface, and can form an infrastructure wireless network via its access radio interface. FIG. 1 shows mesh AP 111 with its infrastructure wireless network 117, including a client station 113 and a client station 115.")**

"a second WiFi wireless access point having second processing logic that cooperates with the first processing logic to define distributed processing logic, the second WiFi wireless access point including second wireless transceiver circuitry to establish a second wireless link with the first wireless transceiver circuitry the second wireless transceiver circuitry including multiple access transceivers to provide a first user access to the WiFi wireless link to the wireless local area network via the second wireless link..." **([para 0032]: "FIG. 2 shows an example mesh AP, say mesh AP 111 that includes a backhaul radio interface 201, an access radio interface 203, and an AP control processor 205 to which the backhaul and access radio interfaces are coupled." ; [para 0103]: "The processing system further may be a distributed processing system with processors coupled by a network.")**

**Rahman** does not explicitly disclose "wherein the multiple access transceivers each provide a given bandwidth and are aggregated by the second processing logic to define a single virtual link with an available bandwidth greater than the given bandwidth" nor "wherein the second processing logic is configured to grant the user access to the wireless local area network via the virtual link based on network resource availability".

However, **Kim** discloses the missing feature "wherein the multiple access transceivers each provide a given bandwidth and are aggregated by the second processing logic to define a single virtual link with an available bandwidth greater than the given bandwidth" **([para 0056]: "For example, if the UE 505 is using a first transceiver having a maximum bandwidth of 20 MHz at a frequency band, and the UE 505 can aggregate carriers of up to 40 MHz at the frequency band, the N/W 510 commands the UE 505 to use a second transceiver that can support the frequency band that has a wider bandwidth than that of the first transceiver." ; [para 0058]: "The UE 505 switches on a transceiver indicated in the message and then aggregates carriers by the newly added transceiver in step 545… In that case, the control message would contain information regarding the frequency bands of the different carriers to be aggregated, center frequency information and bandwidth information as well as identifiers regarding transceivers to be mapped to the different carriers.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** with the link aggregation disclosed by **Kim**. The motivation is to allow for greater bandwidth as compared to only using a single transceiver, thereby enhancing service quality.

**Rahman** in view of **Kim** do not explicitly disclose "wherein the second processing logic is configured to grant the user access to the wireless local area network via the virtual link based on network resource availability".

However, **Conner** discloses the missing feature "wherein the second processing logic is configured to grant the user access to the wireless local area network via the virtual link based on network resource availability" **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may**

**be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

28. Claims 10-12 and 14 are similar to claims 3-5 and 7 and are thus rejected for similar reasons.

29. Regarding claim 16, the claims of **Rahman** discloses:

"A method of providing WiFi wireless local area network access to a user, the method comprising:

communicating with a wireless local area network using first wireless transceiver circuitry associated with a first WiFi wireless access point, the first WiFi wireless access point having a first coverage area; establishing a wireless link between the first WiFi wireless access point and second wireless transceiver circuitry associated with a second WiFi wireless access point, the second WiFi wireless access point having a second coverage area…" **([para 0026]: "Thus, shown in the example mesh network 100 is a root AP 101 with a direct backhaul link to mesh AP 103 and to mesh AP 105. The mesh AP 105 has a direct backhaul link to a mesh point 107 that acts as a relay, to a mesh AP 109. The relay mesh point 107 has a direct backhaul link to mesh AP 111, and, as described above, can be considered mesh AP 107. Each mesh AP has a backhaul radio interface and an access radio interface, and can form an infrastructure wireless network via its access radio interface. FIG. 1 shows mesh AP 111 with its infrastructure wireless network 117, including a client station 113 and a client station 115.")**

"…configuring the first wireless transceiver circuitry and the second wireless transceiver circuitry with distributed logic associated with the first WiFi wireless access point and the second WiFi wireless

access point, wherein the configuring includes, for each WiFi wireless access point, aggregating at least two access transceivers…" **([para 0032]: "FIG. 2 shows an example mesh AP, say mesh AP 111 that includes a backhaul radio interface 201, an access radio interface 203, and an AP control processor 205 to which the backhaul and access radio interfaces are coupled." ; [para 0103]: "The processing system further may be a distributed processing system with processors coupled by a network.")**

**Rahman** does not explicitly disclose "granting a user access to the wireless local area network via a virtual link based on network resource availability" nor "to define the virtual link with an available bandwidth greater than a given bandwidth associated with each access transceiver.".

However, **Kim** discloses the missing feature "to define the virtual link with an available bandwidth greater than a given bandwidth associated with each access transceiver." **([para 0056]: "For example, if the UE 505 is using a first transceiver having a maximum bandwidth of 20 MHz at a frequency band, and the UE 505 can aggregate carriers of up to 40 MHz at the frequency band, the N/W 510 commands the UE 505 to use a second transceiver that can support the frequency band that has a wider bandwidth than that of the first transceiver." ; [para 0058]: "The UE 505 switches on a transceiver indicated in the message and then aggregates carriers by the newly added transceiver in step 545… In that case, the control message would contain information regarding the frequency bands of the different carriers to be aggregated, center frequency information and bandwidth information as well as identifiers regarding transceivers to be mapped to the different carriers.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** with the link aggregation disclosed by **Kim**. The motivation is to allow for greater bandwidth as compared to only using a single transceiver, thereby enhancing service quality.

**Rahman** in view of **Kim** do not explicitly disclose "granting a user access to the wireless local area network via a virtual link based on network resource availability".

However, **Conner** discloses the missing feature "granting a user access to the wireless local area network via a virtual link based on network resource availability" **([para 0017]: "To reduce the overhead required to distribute link-state information across the wireless mesh network 100, primary relay**

**nodes may be selected to generate and forward the link-state information as described herein. The primary relay nodes may be a subset of relay nodes of the wireless mesh network 100. The link-state information may include metric associated with each link of the wireless mesh network 100. For example, the link-state information may include information indicative of quality (e.g., signal-to-noise ratio), available bandwidth (e.g., data rate), and/or other characteristics associated with each link. As a result, the plurality of mesh nodes 102 may identify the best route between a source and a destination in the wireless mesh network 100 based on the link-state information from the primary relay nodes.")**

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the invention, to combine/modify the wireless network of **Rahman** in view of **Kim** to grant access as disclosed by **Conner**. The motivation is to doing so is that it allows access to be granted in a more optimum manner, thereby enhancing service efficiency and reliability.

30. Claims 17-18 and 20 are similar to claims 3-5 and 7 and are thus rejected for similar reasons.

***Allowable Subject Matter***

31. **Claims 5 and 12** would be allowable if rewritten to overcome the double patenting rejections and the rejection(s) under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 5, of the closest prior arts **Rahman** (US 20080084855 A1) in view of **Kim** (US 20110128919 A1) and further in view of **Conner** (US 20060140123 A1) disclose all the features of the parent claims. However, **Rahman** in view of **Kim** and **Conner** do not disclose "the indicator of wireless transceiver availability is fed back from the wireless transceiver circuitry to the distributed processing logic". The cited references fail to anticipate or render the above limitations in combination with all the recited limitations of claims 5 obvious, over any of the prior art of record, alone or in combination. Claim 12 is similar to claim 5 and contains allowable subject matter for similar reasons.

***Conclusion***

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAAD KHAWAR whose telephone number is (571)272-7948. The examiner can normally be reached Monday - Friday, 9:00am - 5:30pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Jiang can be reached on (571)-270-7191. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SAAD KHAWAR/
Primary Examiner, Art Unit 2412

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1.-21. (Canceled)

22. (New) A wireless networking device, comprising:

an application interface connected to a processing interface, the application interface being associated with a first application that, when the wireless networking device is being used, provides a first data stream and that has a first wireless bandwidth requirement;

first, second, and third actual MAC interfaces connected to the processing interface;

first, second, and third actual PHY interfaces connected to the first, second, and third actual MAC interfaces;

first, second, and third wireless transceivers associated with the first, second, and third actual PHY interfaces, wherein the first, second, and third wireless transceivers (i) are suitable for use in a wireless local area network, (ii) have a first, second, and third bandwidth availability up to a first, second, and third actual bandwidth, and (iii) are adapted to emit radio waves in first, second, and third different bands of frequencies, the first, second, and third frequency bands both being higher in frequency than the first frequency band;

wherein the processing interface comprises (i) at least one virtual MAC interface and (ii) first, second, and third virtual PHY interfaces that, during operation of the wireless networking device, feed information regarding the bandwidth availabilities of the first, second, and third wireless transceivers back to the at least one virtual MAC interface;

wherein the processing interface is configured, when the wireless network device is being used, to, in a manner transparent to any layer of the wireless networking device above the processing interface,

(a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces and (iii) a third association between the recipient and the third actual MAC and PHY interfaces, and

(b) (i) identify at least one portion of each one of the first, second, and third bandwidths of the first, second, and third wireless transceivers that are available for communication, and (ii) compare the magnitude of the first bandwidth requirement of the first application to the identified bandwidth availabilities of the first, second, and third wireless transceivers;

wherein, if the first bandwidth requirement is at least partially satisfied by the bandwidth availabilities of a selected two transceivers of the first, second, and third wireless transceivers, then preparing the first data stream for simultaneous transmission to a recipient from both the selected transceivers of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then causing the prepared first data to be transmitted from the selected two transceivers of the first, second, and third wireless transceivers to thereby at least partially satisfy the first wireless bandwidth requirement of the first application; and

wherein the wireless networking device's utilization of the available bandwidth of the first, second, and third wireless transceivers does not prevent any other wireless networking device from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the first, second, and third wireless transceivers for data transmission purposes at the same time that processed data is being sent from the selected one of the first, second, and third wireless transceivers.

23. (New) The wireless networking device of claim 22, wherein the wireless networking device comprises a wireless access point.

24. (New) The wireless networking device of claim 22, wherein the wireless networking device comprises a handheld computing device.

25. (New) The wireless networking device of claim 22, wherein at least one of the first, second and third wireless frequency bands are specified in at least one member of the family of IEEE 802.11 standards.

26. (New) The wireless networking device of claim 25, wherein the at least one member of the family of IEEE 802.11 standards was in existence as of October 30, 2013.

27. (New) The wireless networking device of claim 22, wherein the virtual MAC interface includes a decision block, a processing block and an ultra-streaming block.

28. (New) The wireless networking device of claim 22, wherein, if the first bandwidth requirement is not at least partially satisfied by the bandwidth availabilities of the selected transceivers of the first, second, and third wireless transceivers, then preparing the first data stream for simultaneous transmission to the recipient from all of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then actually causing the prepared first data stream to be transmitted from the first, second, and third transceivers to thereby at least partially satisfy the first wireless bandwidth requirement of the first application.

29. (New) The wireless networking device of claim 28, wherein, if the identified bandwidth of the first wireless transceiver becomes unavailable during use of the wireless networking device, then the processing interface is adapted to, as a result of the unavailability and in a manner transparent to any layer of the wireless networking device above the processing interface, identify another at least one portion of the bandwidth of any of the first, second or third wireless transceivers and then prepare the first data stream for transmission to the recipient additionally using a specific subset of frequencies corresponding to the newly identified at least one portion of bandwidth of any of the first, second or third wireless transceivers to thereby continue to at least partially satisfy the first wireless bandwidth requirement of the first application.

30. (New) The wireless networking device of claim 29, wherein, if the identified bandwidth of the second wireless transceiver becomes unavailable during use of the wireless networking device, then the processing interface is adapted to, as a result of the unavailability and in a manner transparent to any layer of the wireless networking device above the processing interface, identify another at least one portion of the bandwidth of any of the first, second or third

wireless transceivers and then prepare the first data stream for transmission to the recipient additionally using a specific subset of frequencies corresponding to the newly identified at least one portion of bandwidth of any of the first, second or third wireless transceivers to thereby continue to at least partially satisfy the first wireless bandwidth requirement of the first application.

31. (New) The wireless networking device of claim 30, wherein, if the identified bandwidth of the third wireless transceiver becomes unavailable during use of the wireless networking device, then the processing interface is adapted to, as a result of the unavailability and in a manner transparent to any layer of the wireless networking device above the processing interface, identify another at least one portion of the bandwidth of any of the first, second or third wireless transceivers and then prepare the first data stream for transmission to the recipient additionally using a specific subset of frequencies corresponding to the newly identified at least one portion of bandwidth of any of the first, second or third wireless transceivers to thereby continue to at least partially satisfy the first wireless bandwidth requirement of the first application.

32. (New) The wireless networking device of claim 31,

wherein the application interface is associated with a second application that, when the wireless networking device is being used, provides a second data stream and has a second wireless bandwidth requirement;

wherein the processing interface is configured, when the wireless network device is being used, to, in a manner transparent to any layer of the wireless networking device above the processing interface, (i) identify at least one portion of each one of the first, second, and third bandwidths of the first, second, and third wireless transceivers that are available for communication, and (ii) compare the magnitude of the first and second bandwidth requirements of the first and second applications to the identified bandwidth availabilities of the first, second, and third wireless transceivers; and

wherein if the bandwidth requirements of the first and second applications are at least partially satisfied by the bandwidth availabilities of the selected transceivers of the first, second, and third wireless transceivers, then preparing the first and second data streams for

simultaneous transmission to the recipient from both the selected transceivers of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then causing the prepared first and second data streams to be transmitted from the selected transceivers of the first, second, and third transceivers to thereby at least partially satisfy the first and second wireless bandwidth requirements of the first and second applications.

33. (New) The wireless networking device of claim 32, wherein if the bandwidth requirements of the first and second applications are not at least partially satisfied by the bandwidth availabilities of the selected transceivers of the first, second, and third wireless transceivers, then preparing the first and second data streams for simultaneous transmission to the recipient from all of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then cause the prepared first and second data streams to be transmitted from the first, second, and third transceivers to thereby at least partially satisfy the first and second wireless bandwidth requirements of the first and second applications.

34. (New) The wireless networking device of claim 33, wherein at least one of the first, second, and third wireless transceivers are adapted to communicate with the recipient via a programmable variable duplex link that exhibits an asymmetric transmit and receive profile.

35. (New) The wireless networking device of claim 22, wherein the at least one portion of the first bandwidth of the first transceiver comprises a single portion.

36. (New) The wireless networking device of claim 22, wherein the at least one portion of the first bandwidth of the first transceiver is contiguous.

37. (New) The wireless networking device of claim 22, wherein the at least one portion of the second bandwidth of the second transceiver comprises a single portion.

38. (New) The wireless networking device of claim 22, wherein the at least one portion of the second bandwidth of the second transceiver is contiguous.

39. (New) The wireless networking device of claim 22, wherein the at least one portion of the third bandwidth of the third transceiver comprises a single portion.

40. (New) The wireless networking device of claim 22, wherein the at least one portion of the third bandwidth of the third transceiver is contiguous.

41. (New) The wireless networking device of claim 22, wherein the first, second, and third virtual PHY layers are not contiguous with the virtual MAC layer.

## AMENDMENTS TO THE DRAWINGS

The attached 11 sheet(s) of drawings include changes to FIGS. 1-5. These sheets, which include (renumbered) FIGS. 1, 2, 3, 4, 5A, 5B, 6, 7, 8, 9, 10A, 10B, 10C, 11, replace all original sheets 1 through 5 and add new sheets 6 through 11. The replacement and new sheets add figures from prior applications incorporated by reference. Specifically, replacement FIGS. 1, 2, 3, 4, 5A, 5B, and 6 are from U.S. Patent 9,788,305 (incorporated by reference in ¶ [0018] of this application as-filed). Replacement FIGS. 1, 3, 4, 5A, 5B, and 6 also appear in Ser. No. 61897216 (incorporated by reference in ¶ [0001] of this application as-filed). Correspondence between the figure numbers in the replacement sheets, the application as-filed, and the prior incorporated applications are provided in the table below.

| Replacement Sheets | This Application (As-Filed) | Prov. Ser. No. 61897216 | Prov. Ser. No. 61897219 | U.S. Pat. No. 9,788,305 |
|---|---|---|---|---|
| 1 | 2 | 1 | | 1 |
| 2 | | | | 2 |
| 3 | | 2 | | 3 |
| 4 | | 3 | | 4 |
| 5A/5B | | 5A/5B | | 5A/5B |
| 6 | | 4 | | 6 |
| 7 | 1 | | 1A/1B | |
| 8 | 2 | | | |
| 9 | 3 | | | |
| 10A/10B/10C | 4A/4B/4C | | 4A/4B/4C | |
| 11 | 5 | | 2 | |

Throughout the replacement sheets, reference numerals have been revised to avoid duplication and proceed in generally ascending order based on the renumbered figures. No new matter has been added.

Attachment(s):

Replacement Sheets 1-5;

New Sheets 6-11.

## REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination are respectfully requested.

### Status of All of the Claims

Below is the status of the claims in this application.

1. Claim(s) pending: 2-21.
2. Claim(s) canceled: 2-21.
3. Claim(s) added: 22-41.
4. Claims withdrawn from consideration but not canceled: none.

### Claim Support

It is believed that the above-identified new claims are supported by the application as originally filed, including disclosures in prior applications which were incorporated by reference at the time of filing. For example, support for these claims can be at least found in the priority provisional applications as detailed in the chart appended to this filing. Applicant anticipates submitting a Rule 132 declaration from the inventor regarding claim support.

### Specification and Drawing Amendments

It is believed that the amendments to the specification and drawings submitted herewith are supported by the application as originally filed, including disclosures in prior applications. In particular, the amendments to the specification conform to the disclosure of U.S. Patent No. 9,788,305, which was incorporated by reference in the application (*see* ¶ [0018] of the application as-filed). New ¶¶ [0017]–[0034] are inserted and correspond to the text of Cols. 1:60–5:50 of the '305 Patent. The amendments to the background and brief description of the drawings likewise match up with the text of the '305 Patent. Marked-up and clean versions of a substitute specification are enclosed. Additional drawings are likewise taken from the incorporated '305 Patent and the provisional applications to which priority is claimed. Reference numerals are revised throughout to correspond to the set of combined drawings. No new matter has been added.

**Allowable Subject Matter**

In the last office action, the Examiner indicated that cancelled claim 5, concerning feeding back to processing circuitry information regarding the bandwidth availability of multiple transceivers, would be allowable if rewritten in independent form. Please note that this feature is included in independent claim 22, which includes the limitation "wherein… during operation of the wireless networking device, feed information regarding the bandwidth availabilities of the first, second, and third wireless transceivers back to the at least one virtual MAC interface." The new claims also include a limitation that at least some bandwidth availability of a selected transceiver is aggregated to facilitate a wireless networking device attempting to at least partially satisfy a first bandwidth requirement of a first application. The new claims also include significantly more description regarding the wireless transceiver circuitry as well as the processing circuitry.

As an additional matter, the Examiner's attention is drawn to the fact that the word "unavailable" and "unavailability" are used in dependent claims 29-31. It is applicant's intention that these words refer to, for example, a partial or complete loss of certain transceiver resources as well as a situation where a different band than the one currently in use provides more bandwidth available for transmission. A replacement transmission resource is found if either of these conditions happen.

It is respectfully submitted that the inclusion of these new claims in this application is proper and that they are ripe for consideration. The Examiner's confirmation of this is earnestly solicited.

**Priority**

At page 2, item 3 of the Office Action, it is stated that certain claims are not supported by prior applications. All of those claims are cancelled so that issue is moot due to the presentation of amended claims herein. Applicant submits that the claims presented in the amendments herein have support and properly claim priority to earlier applications for at least the reasons stated above and as noted in the charts that appear below.

**Claim Rejections – 35 USC § 112**

At page 3, items 4-6, claim 2 is rejected under § 112. Claim 2 has been cancelled; accordingly, Applicant submits that this refusal is moot.

It is respectfully submitted that the new claims are not subject to rejection on the same basis as cancelled claim 2 was rejected. The Examiner's confirmation of this is earnestly solicited.

**Double Patenting**

At pages 3-9, items 7-17, various claims are rejected on the grounds of non-statutory double patenting. All of the claims subject to this rejection have been cancelled; accordingly, Applicant submits that this refusal is moot.

However, in an effort to expedite the prosecution of this application, a terminal disclaimer is submitted herewith to obviate any potential double patenting rejections that might be made with respect to any patents related to this application. The Examiner's confirmation that the new claims are not subject to rejection on this basis is earnestly solicited.

**Claim Rejections – 35 USC § 103**

At pages 9-20, items 18-30, various claims are rejected under § 103 over the combination of Rahman, Kim, and Connor. All of the claims subject to this rejection have been cancelled; accordingly, Applicant submits that this refusal is moot.

Applicant expects that a Rule 132 declaration from the sole inventor Sai Manapragada will be filed in the next couple of weeks. This declaration will contain a detailed analysis of why none of the art of record, including the art cited in the IDS contemporaneously filed herewith, either taken alone or in any purported combination with each other teaches or suggests one or more elements of new independent claim 22. The declaration also will providence evidence of secondary considerations that support the patentability of the new claims. Applicant will diligently work to finish this declaration and submit it to the Examiner for his consideration.

**Detailed Claim Support**

It is respectfully submitted that the claims are supported by the application, including prior applications that were incorporated by reference into this application at the time of filing. Exemplary explanations of supporting disclosures are described in the following chart.

| New Claims | Exemplary Support In The Specification |
|---|---|
| 22. (New) A wireless networking device, comprising the steps of:<br><br>an application interface connected to a processing interface, the application interface being associated with a first application that, when the wireless networking device is being used, provides a first data stream and that has a first wireless bandwidth requirement;<br><br>first, second, and third actual MAC interfaces connected to the processing interface;<br><br>first, second, and third actual PHY interfaces connected to the first, second, and third actual MAC interfaces;<br><br>first, second, and third wireless transceivers associated with the first, second, and third actual PHY interfaces, wherein the first, second, and third wireless transceivers (i) are suitable for use in a wireless local area network, (ii) have a first, second, and third bandwidth availability up to a first, second, and third actual bandwidth, and (iii) are adapted to emit radio waves in first, second, and third different bands of frequencies, the second, and third frequency bands both being higher in frequency than the first frequency band;<br><br>wherein the processing interface comprises (i) at least one virtual MAC interface and (ii) first, second, and third virtual PHY interfaces that, during operation of the wireless networking device, feed information | Figure 1 of the 10/30/2013 '216 provisional shows a wireless networking device in a "layer" format. It includes an "application interface" with four applications A-D. The bandwidth requirements of each app are shown in the figure (*e.g.*, 75 Mbps for App B). Each app runs on the wireless networking device produces a data stream during operation.<br><br>Figure 1 also shows a process layer that forms an example of the claimed "processing interface."<br><br>Figure 1 also shows four individual actual MAC layers connected to the processing interface.<br><br>Figure 1 also shows a single actual PHY layer connected to each one of the actual MAC layers.<br><br>On page two of the 10/30/2013 '216 provisional, "Wi-Fi radios" and "multiple radios" are referenced. A single radio is associated with each individual actual PHY layer. Each radio has bandwidth availability up to an actual bandwidth. Wi-Fi radios emit radio waves in different bands of frequencies such as, for example, 2.4 GHz, 5 GHz and 6 GHz.<br><br>Figure 1 also shows a single RF block in the process layer of the wireless networking device. This indicates that an RF block (*i.e.*, virtual PHY interface) is included in the |

| New Claims | Exemplary Support In The Specification |
|---|---|
| regarding the bandwidth availabilities of the first, second, and third wireless transceivers back to the at least one virtual MAC interface;<br><br>wherein the processing interface is configured, when the wireless network device is being used, to, in a manner transparent to any layer of the wireless networking device above the processing interface,<br><br>(a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces and (iii) a third association between the recipient and the third actual MAC and PHY interfaces, and | process interface for each one of the actual PHY interfaces and radios used.<br><br>Page 6 of the 10/30/2013 '216 provisional references that an RF block communicates directly with the ultra-streaming block about actual resource availability. Figure 1 of that application shows four actual PHY layers each of which contains a radio. This indicates, for example, that the processing interface creates an association between a recipient and each one of the first, second, and third actual MAC and PHY layers. |
| (b) (i) identify at least one portion of each one of the first, second, and third bandwidths of the first, second, and third wireless transceivers that are available for communication, and (ii) compare the magnitude of the first bandwidth requirement of the first application to the identified bandwidth availabilities of the first, second, and third wireless transceivers; | Page 6 of the 10/30/2013 '216 provisional references that an RF block communicates directly with the ultra-streaming block about actual resource availability. Figure 1 of that application shows four actual PHY layers each of which contains a radio.<br><br>Page 6 also states that each radio has 300 Mbps of bandwidth available. Figure 1 shows that App B has a bandwidth requirement of 75 Mbps. In operation, the processing interface will determine which radios have available bandwidth, and then select one from which the processed data stream for App A will be sent to a recipient. None of the interfaces of the wireless networking device above the processing interface are aware of the processing interface's routing decisions.<br><br>Page 6 of the 10/30/2013 '216 provisional states that in "a preferred embodiment, the RF block in the virtual PHY layer communicates directly with the Ultra-Streaming Block about actual resource availability and the Ultra-Streaming Block sends the information back to the Decision Block in the virtual MAC |

| New Claims | Exemplary Support In The Specification |
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| | layer." That page also says that the "system is designed to perform its function while maintaining quality of service for a given class of service."<br><br>This indicates, for example, a comparison is made of the first bandwidth requirement to the bandwidth availabilities of the second, and third transceivers, the first data stream is prepared for transmission from the second, and third transceivers on frequencies that correspond to the identified bandwidth of each transceiver that is available for communication, and then is actually transmitted to at least partially satisfy the first bandwidth requirement. |
| wherein, if the first bandwidth requirement is at least partially satisfied by the bandwidth availabilities of the selected transceivers of the first, second, and third wireless transceivers, then preparing the first data stream for simultaneous transmission to a recipient from both the selected transceivers of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then causing the prepared first data to be transmitted from the selected transceivers of the first, second, and third wireless transceivers to thereby at least partially satisfy the first wireless bandwidth requirement of the first application; and | See the discussion in the immediately preceding row of this table. |
| wherein the wireless networking device's utilization of the available bandwidth of the first, second, and third wireless transceivers does not prevent any other wireless networking device from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the first, second, and third wireless transceivers for data transmission purposes at the same time that processed data is being sent from the | Page 6 of the 10/20/2013 '216 provisional states that as "shown in Fig. 1, a physical resource can be shared." Referring specifically to Figure 1, Apps A and D share the bandwidth of one of the radios. Assuming that the wireless networking device is an access point, and that the radio apps A and D share is a 5 GHz Wi-Fi radio, this means that apps A and D each use one-half of the frequencies in the 5GHz band. The access |

| New Claims | Exemplary Support In The Specification |
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| selected one of the first, second, and third wireless transceivers. | point transmits a data stream for app A to a recipient using the lower half of the 5 GHz band while simultaneously using the upper half of the 5 GHz band to transmit a data stream for app D to a recipient.<br><br>This shows, for example, that an access point can simultaneously transmit to two clients using the shared resources of a single Wi-Fi band.<br><br>This also shows, for example, that two clients can transmit to the access point at the same time during a Wi-Fi transmission opportunity. For example, one client could run app B with a 75 Mbps bandwidth requirement and a second client could run app C which has a 225 Mbps bandwidth requirement. The first client uses the lower portion of the 5 GHz band and the client running app C uses the upper portion of the 5 GHz band. |
| 23. (New) The wireless networking device of claim 22, wherein the wireless networking device comprises a wireless access point. | Figure 1 of the 10/30/2013 '216 provisional shows a generic wireless networking device in a "layer" format that is understood to be, for example, a wireless access point. |
| 24. (New) The wireless networking device of claim 22, wherein the wireless networking device comprises a handheld computing device. | Figure 1 of the 10/30/2013 '216 provisional shows a generic wireless networking device in a "layer" format that is understood to be, for example, a handheld computing device. |
| 25. (New) The wireless networking device of claim 1, wherein at least one of the first, second, and third wireless frequency bands are specified in at least one member of the family of IEEE 802.11 standards. | Page 2 of the 10/20/2013 '216 provisional discloses "Wi-Fi radios" and page 3 mentions "IEEE 802.11." |
| 26. (New) The wireless networking device of claim 25, wherein the at least one member of the family of IEEE 802.11 standards was in existence as of October 30, 2013. | Page 2 of the 10/20/2013 '216 provisional discloses "Wi-Fi radios" and page 3 mentions "IEEE 802.11." |
| 27. (New) The wireless networking device of claim 22, wherein the virtual MAC interface includes a decision block, a processing block and an ultra-streaming block. | See, for example, Figure 1 of the 10/30/2013 '216 provisional which shows a decision block, a processing block and an ultra-streaming block. |

| New Claims | Exemplary Support In The Specification |
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| 28. (New) The wireless networking device of claim 22, wherein, if the first bandwidth requirement is not at least partially satisfied by the bandwidth availabilities of the selected transceivers of the first, second, and third wireless transceivers, then preparing the first data stream for simultaneous transmission to the recipient from all of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then actually causing the prepared first data stream to be transmitted from the first, second, and third transceivers to thereby at least partially satisfy the first wireless bandwidth requirement of the first application. | The portions cited in claim 22 above also indicate, for example, that the identified bandwidth of a first transceiver is added to the mix. The first data stream is prepared for transmission from all three of the first, second, and third transceivers on frequencies that correspond to the identified bandwidth of each transceiver that is available for communication. The prepared first data stream is then actually transmitted using all three transceivers. |
| 29. (New) The wireless networking device of claim 28, wherein, if the identified bandwidth of the second wireless transceiver becomes unavailable during use of the wireless networking device, then the processing interface is adapted to, in a manner transparent to any layer of the wireless networking device above the processing interface, identify another at least one portion of the bandwidth of the second wireless transceiver and then prepare the first data stream for transmission to the recipient using a specific subset of frequencies corresponding to the newly identified at least one portion of bandwidth of the second wireless transceiver to thereby continue to at least partially satisfy the first wireless bandwidth requirement of the first application. | Page 6 of the 10/30/2013 '216 provisional states that in "a preferred embodiment, the RF block in the virtual PHY layer communicates directly with the Ultra-Streaming Block about actual resource availability and the Ultra-Streaming Block sends the information back to the Decision Block in the virtual MAC layer." That page also says that the "system is designed to perform its function while maintaining quality of service for a given class of service."<br><br>This indicates, for example, that if a portion of bandwidth is lost during use for various reasons (*e.g.*, environmental conditions or congestion), then a replacement transceiver resource is identified and then used in place of the transceiver bandwidth resource that was lost. |
| (New) The wireless networking device of claim 29, wherein, if the identified bandwidth of the second wireless transceiver becomes unavailable during use of the wireless networking device, then the processing interface is adapted to, as a result of the unavailability and in a manner transparent to | See claim 29. |

| New Claims | Exemplary Support In The Specification |
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| any layer of the wireless networking device above the processing interface, identify another at least one portion of the bandwidth of any of the first, second or third wireless transceivers and then prepare the first data stream for transmission to the recipient additionally using a specific subset of frequencies corresponding to the newly identified at least one portion of bandwidth of any of the first, second or third wireless transceivers to thereby continue to at least partially satisfy the first wireless bandwidth requirement of the first application. | |
| 31. (New) The wireless networking device of claim 29, wherein, if the identified bandwidth of the third wireless transceiver becomes unavailable during use of the wireless networking device, then the processing interface is adapted to in a manner transparent to any layer of the wireless networking device above the processing interface identify another at least one portion of the bandwidth of the third wireless transceiver and then prepare the first data stream for transmission to the recipient using a specific subset of frequencies corresponding to the newly identified at least one portion of bandwidth of the third wireless transceiver to thereby continue to at least partially satisfy the first wireless bandwidth requirement of the first application. | See claim 29. |
| 32. (New) The wireless networking device of claim 30, wherein the application interface is associated with a second application that, when the wireless networking device is being used, provides a second data stream and has a second wireless bandwidth requirement; and<br><br>wherein the processing interface is configured, when the wireless network device is being used, to in a manner transparent to any layer of the wireless networking device | See above with respect to claim 22. |

| New Claims | Exemplary Support In The Specification |
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| above the processing interface, (i) identify at least one portion of each one of the first, second, and third bandwidths of the first, second, and third wireless transceivers that are available for communication, and (ii) compare the magnitude of the first and second bandwidth requirements of the first and second applications to the identified bandwidth availabilities of the first, second, and third wireless transceivers, wherein<br><br>if the bandwidth requirements of the first and second applications are at least partially satisfied by the bandwidth availabilities of the first, second, and third wireless transceivers, then preparing the first and second data streams for simultaneous transmission to the recipient from both the second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then causing the prepared first and second data streams to be transmitted from the second, and third transceivers to thereby at least partially satisfy the first and second wireless bandwidth requirements of the first and second applications. | |
| 33. (New) The wireless networking device of claim 31, wherein if the bandwidth requirements of the first and second applications are not at least partially satisfied by the bandwidth availabilities of the first, second, and third wireless transceivers, then preparing the first and second data streams for simultaneous transmission to a recipient from all of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then cause the prepared first and second data streams to be transmitted from the first, | See above with regard to claim 31. |

| New Claims | Exemplary Support In The Specification |
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| second, and third transceivers to thereby at least partially satisfy the first and second wireless bandwidth requirements of the first and second applications. | |
| 34. (New) The wireless networking device of claim 32, wherein at least one of the first, second, and third wireless transceivers are adapted to communicate with the recipient via a variable duplex link. | See Figures 4 and 5B of the 10/30/2013 '216 provisional application. |
| 35. (New) The wireless networking device of claim 22, wherein the at least one portion of the first bandwidth of the first transceiver comprises a single portion. | See above with respect to claim 22. |
| 36. (New) The wireless networking device of claim 22, wherein the at least one portion of the first bandwidth of the first transceiver is contiguous. | See above with respect to claim 22. |
| 37. (New) The wireless networking device of claim 1, wherein the at least one portion of the second bandwidth of the second transceiver comprises a single portion. | See above with respect to claim 22. |
| 38. (New) The wireless networking device of claim 1, wherein the at least one portion of the second bandwidth of the second transceiver is contiguous. | See above with respect to claim 22. |
| 39. (New) The wireless networking device of claim 1, wherein the at least one portion of the third bandwidth of the third transceiver comprises a single portion. | See above with respect to claim 22. |
| 40. (New) The wireless networking device of claim 1, wherein the at least one portion of the third bandwidth of the third transceiver is contiguous. | See above with respect to claim 22. |
| 41. (New) The wireless networking device of claim 1, wherein the first, second, and third virtual PHY interfaces are not contiguous with the virtual MAC layer. | See, for example, Figure 1 of the 10/30/2013 '216 application. |

**Conclusion**

For the reasons provided above as well as for other reasons, such as those stated in the Rule 132 declaration to be submitted soon, it is respectfully submitted that this application is now in condition for allowance and an early notice of allowance is requested. If the Examiner feels that any issues remain which must be resolved before the application can be allowed, the Examiner is invited to contact the undersigned representative.

Respectfully submitted,

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| Notice of Allowability | Application No. 17/468,509 | Applicant(s) Manapragada, Sai C. | |
|---|---|---|---|
| | Examiner SAAD KHAWAR | Art Unit 2412 | AIA (FITF) Status Yes |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 9/28/23.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 22-26 and 28-48 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   **Certified copies:**

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/SAAD KHAWAR/
Primary Examiner, Art Unit 2412

***Allowable Subject Matter***

1. **Claims 22-26 and 28-48** are allowed.

2. The following is a statement of reasons for allowance.

Regarding claims 22, of the closest prior arts **Rahman** (US 20080084855 A1) in view of **Kim** (US 20110128919 A1), **Yen** (US 20150098359 A1), and further in view of **Conner** (US 20060140123 A1) disclose features of the instant claim. However, **Rahman** in view of **Kim, Yen,** and **Conner** do not disclose all the features of "A wireless networking device, comprising: an application interface connected to a processing interface, the application interface being associated with a first application, the first application providing, when the wireless networking device is being used, a first data stream and having a first wireless bandwidth requirement; first, second, and third actual MAC interfaces connected to the processing interface; first, second, and third actual PHY interfaces connected to the first, second, and third actual MAC interfaces; first, second, and third wireless transceivers respectively associated with the first, second, and third actual PHY interfaces, wherein each one of the first, second, and third wireless transceivers (i) is suitable for use in a wireless local area network, (ii) has a first, second, and third bandwidth availability up to a first, second, and third actual bandwidth, and (iii) is adapted to emit radio waves in first, second, and third different bands of frequencies, the second, and third frequency bands both being higher in frequency than the first frequency band; wherein the processing interface comprises (i) at least one virtual MAC interface and (ii) first, second, and third virtual PHY interfaces that, during operation of the wireless networking device, feed information regarding the bandwidth availabilities of the first, second, and third wireless transceivers back to the at least one virtual MAC interface; wherein the processing interface is configured to, when the wireless network device is being used, to, in a manner transparent to any layer of the wireless networking device above the processing interface,(a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces and (iii) a third association between the recipient and the third actual MAC and PHY interfaces, and (b) (i) identify at least one portion of each one of the first, second, and third bandwidths of the first, second, and third wireless transceivers that are available for communication, and (ii) evaluate the identified bandwidth availabilities of the first, second, and third wireless transceivers with respect to the first bandwidth

requirement of the first application; wherein, if the first bandwidth requirement is at least partially satisfied by the bandwidth availabilities of a selected two transceivers of the first, second, and third wireless transceivers, preparing the first data stream for simultaneous transmission to a recipient from both the selected transceivers of the first, second, and third wireless transceivers using a specific subset of frequencies corresponding to the identified portions of their available bandwidth and then causing the prepared first data to be transmitted from the selected two transceivers of the first, second, and third wireless transceivers to thereby at least partially satisfy the first wireless bandwidth requirement of the first application; and wherein the wireless networking device's utilization of the available bandwidth of the first, second, and third wireless transceivers does not prevent other wireless networking devices from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the first, second, and third wireless transceivers for data transmission purposes at the same time that processed data is being sent from the selected one of the first, second, and third wireless transceivers" in combination. The cited references fail to anticipate or render the above limitations in combination with all the recited limitations of claims 22 obvious, over any of the prior art of record, alone or in combination. The remaining claims depend on claim 22 and are allowed for similar reasons.

***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAAD KHAWAR whose telephone number is (571)272-7948. The examiner can normally be reached Monday - Friday, 9:00am - 5:00pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Jiang can be reached on (571)-270-7191. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To

file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SAAD KHAWAR/
Primary Examiner, Art Unit 2412